

REMARKS

In the last Office Action, the Examiner objected to claims 1 and 5; rejected claims 2 and 5-10 under 35 U.S.C. § 112, 2nd paragraph; rejected claims 1-10 under 35 U.S.C. § 102(a) as being anticipated by Japanese Publication No. 2000-063963 (JP '963); rejected claims 1-10 under 35 U.S.C. § 103(a) as being unpatentable over JP '963; rejected claims 1, 3, 4, 5, 9, and 10 under 35 U.S.C. § 102(b) as being anticipated by Edwards et al. (U.S. Patent No. 5,888,270); and rejected claims 1, 3, 4, 5, 9, and 10 under 35 U.S.C. § 103(a) as being unpatentable over Edwards et al.

By this Amendment, Applicants have clarified the claim language and have further defined the presently claimed embodiment. Applicants have corrected the informalities that the Examiner identified in claims 1 and 5. Accordingly, the objection to claims 1 and 5 should be withdrawn.

Applicants respectfully traverse the rejection of claims 2 and 5-10 under 35 U.S.C. § 112, 2nd paragraph. Applicants have addressed each of the issues raised by the Examiner in paragraphs 5, 6, and 7 of the Office Action and respectfully submit that pending claims 1-10 comply with the provisions of Section 112, 2nd paragraph. Accordingly, the Section 112, 2nd paragraph rejection of claims 2 and 5-10 should be withdrawn.

Applicants respectfully traverse the rejection of claims 1-10 under 35 U.S.C. § 102(a) as being anticipated by JP '963 for at least the reason that JP '963 fails to disclose every claim element. For example, both independent claim 1 and independent claim 5 recite a combination of method steps including, *inter alia*, producing a slag, in which a weight ratio of CaO to (SiO₂ + CaO) ("the CaO ratio") is greater than 0.6 to 0.85 and a weight ratio of Fe to (FeO_x + SiO₂ + CaO) ("the Fe ratio")

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is greater than 0.5 to 0.6. JP '963 fails to disclose at least these claim elements. For example, JP '963 discloses a CaO ratio of 0.3 to 0.6 and an Fe ratio of 0.2 to 0.5. JP '963 fails to disclose that the CaO ratio can be greater than 0.6 or that the Fe ratio can be greater than 0.5. For at least these reasons, the Section 102(a) rejection of claims 1-10 is improper and should be withdrawn.

Applicants also respectfully traverse the rejection of claims 1-10 under 35 U.S.C. § 103(a) as being unpatentable over JP '963. No *prima facie* case of obviousness has been established with respect to claims 1-10 for at least the reason that JP '963 fails to disclose or suggest every claim element. As noted above, JP '963 fails to disclose the CaO ratio of greater than 0.6 to 0.85 and the Fe ratio of greater than 0.5 to 0.6, as included in independent claims 1 and 5. Further, JP '963 nowhere suggests using a CaO ratio outside its disclosed range of 0.3 to 0.6 or an Fe ratio outside its disclosed range of 0.2 to 0.5. Because, JP '963 neither teaches nor suggests the CaO ratio or the Fe ratio of the presently claimed embodiment, the Section 103(a) rejection of claims 1-10 based on JP '963 is improper and should be withdrawn.

Applicants respectfully traverse the rejection of claims 1, 3, 4, 5, 9, and 10 under 35 U.S.C. § 102(b) as being anticipated by Edwards et al. for at least the reason that Edwards et al. fails to disclose every claim element. For example, both independent claim 1 and independent claim 5 recite a combination of method steps including, *inter alia*, oxygen-smelting the copper sulfide concentrate using a concentrate burner located above a melt. Edwards et al. fails to teach or suggest at least this claim element.

Rather than using a concentrate burner located above the melt, as in the presently claimed embodiment, Edwards et al. discloses the use of a *submerged* lance that is located "deep within the continuous slag phase." (Fig. 2; col. 2, lines 29-36). For at

least this reason, the Section 102(b) rejection of claims 1, 3, 4, 5, 9, and 10 is improper and should be withdrawn.

Applicants also respectfully traverse the rejection of claims 1, 3, 4, 5, 9, and 10 under 35 U.S.C. § 103(a) as being unpatentable over Edwards et al. No *prima facie* case of obviousness has been established with respect to claims 1, 3, 4, 5, 9, and 10 for at least the reason that Edwards et al. fails to disclose or suggest every claim element. As noted above, Edwards et al. fails to disclose oxygen-smelting a copper sulfide concentrate using a concentrate burner located above a melt, as included in independent claims 1 and 5. Further, there is no suggestion in Edwards et al. to depart from the disclosed "deep lance practice", which "ensures a recirculating slag flow pattern." (col. 3, lines 43-45). Because, Edwards et al. neither teaches nor suggests every claim element of the presently claimed embodiment, the Section 103(a) rejection of claims 1, 3, 4, 5, 9, and 10 based on Edwards et al. is improper and should be withdrawn.

In view of the foregoing, Applicant respectfully requests the reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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Dated: February 11, 2003

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APPENDIX

Attachment to the Amendment filed: February 11, 2003

Application Serial No.: 09/933,721

Attorney Docket No.: 08009.0006

Marked-up version of the amended claims:

1. A method of smelting copper sulfide concentrate comprising: [by]
oxygen-smelting the copper sulfide concentrate[, and] using a concentrate burner
located above a melt;

removing most of Fe in the copper sulfide concentrate into slag₁ [as well as]
removing [part or most of the] at least a portion of S [therein] in the copper sulfide
concentrate as SO₂[, thereby]; and

obtaining copper from copper sulfide concentrate as at least one of white metal,
nearly white matte, and [or] blister copper[.];

wherein [the method characterized in that] the oxygen-smelting [is carried out to
produce;] produces a slag₁ in which a weight ratio of CaO to (SiO₂ + CaO) is greater
than 0.6 to 0.85 and a weight ratio of Fe to (FeO_x + SiO₂ + CaO) is greater than 0.5 to
0.6₁ and at least one of white metal, nearly white metal matte, [or] and blister copper[,]
by adding SiO₂ material and CaO material to the copper sulfide concentrate as flux.

2. A method of smelting copper sulfide concentrate according to Claim 1,
further comprising: [wherein the produced slag is]

slowly [cooled] cooling the slag until at least a portion of the slag is [for] solidified;
[and then subjected]

subjecting the slag to [pulverizing] pulverization and flotation to produce
recovered copper[:.], and [the]

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subjecting the recovered copper [content is again subjected] to the oxygen smelting process.

5. A method of smelting copper sulfide concentrate, comprising: [by] oxygen-smelting the copper sulfide concentrate[, and] using a concentrate burner located above a melt;

removing part of Fe [and part of the S] in the copper sulfide concentrate [in] to a first slag and part of S in the copper sulfide concentrate to SO₂[, and further] to produce a matte comprising FeS and Cu₂S;

adding SiO₂ material and CaO material to the matte; and

oxygen-smelting [a] the matte[, being a mixture of obtained FeS and Cu₂S] to remove Fe [and S] as a second slag and to remove S as [SiO₂] SO₂, thereby obtaining blister copper[.];

wherein [the method characterized in that oxygen-smelting is carried out to produce; a] the second slag [in which] has a weight ratio of CaO to (SiO₂ + CaO) [is] of greater than 0.6 to 0.85 and a weight ratio of Fe to (FeO_x + SiO₂ + CaO) [is] of greater than 0.5 to 0.6[, and blister copper, by adding SiO₂ material and CaO material to the matte].

6. A method for smelting copper sulfide concentrate according to Claim 5, further comprising: [wherein the produced slag is]

slowly [cooled] cooling at least one of the first and second slags [and solidified] for solidification; [and then subjected to]

subjecting the at least one of the first and second slags to [pulverizing]
pulverization and flotation to produce recovered copper;[,] and [the]

subjecting the recovered copper [content is again subjected] to the matte oxygen
smelting process.

7. A method of smelting copper sulfide concentrate according to Claim 5,
wherein [the produced slag] at least one of the first and second slags is maintained in a
molten condition and again subjected to the matte oxygen-smelting process.

8. A method of smelting copper sulfide concentrate according to Claim 5,
wherein [the produced slag] at least one of the first and second slags is cooled and
solidified and then again subjected to the matte oxygen-smelting process.

9. A method of smelting copper sulfide concentrate according to Claim 5,
wherein the SiO₂ content in the matte is at least 1.7% by weight with respect to the Fe
to be removed in the second slag.

10. A method of smelting copper sulfide concentrate according to Claim 5,
wherein the temperature of the [produced] second slag is maintained up to 1280°C.

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